

# An evaluation of the core physical exam in patients with minor peripheral chief complaints

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**Objective:** We sought to determine (1) how often and why emergency medicine resident physicians perform core physical exams in patients with minor peripheral chief complaints (MCCs); and (2) the clinical impact this practice.

**Methods:** This prospective observational study was conducted at an urban emergency department with a 4 year emergency medicine residency. Charts of all emergency department patients presenting with MCCs in June–September 2003 were reviewed by blinded assistants for documentation of (1) core physical exams; (2) abnormal core physical exam findings; and (3) additional work up, treatment or follow up related to abnormal core physical exam findings. In May–June 2004 all emergency medicine residents were asked how often they perform core physical exams on emergency department patients with MCCs and their motivating factors for this practice.

**Results:** 297 patients met MCC inclusion/exclusion criteria. Among the 591 total cardiac, lung and abdominal exams performed, 8 (1.4%, 95% confidence interval (CI) 0.7% to 2.7%) were abnormal and only 1 (0.1%, 95% CI 0% to 0.1%) finding led to further testing (ECG); none prompted change in treatment or follow up. All 46 eligible emergency medicine residents were evaluated; 72% (33) performed core physical exams in half or more patients with MCCs. Their primary reasons were to screen the underserved emergency department population, the belief that such exams are standard of care, and establishment of physician–patient rapport.

**Conclusions:** Because they want to screen an underserved population, establish rapport, and meet what they believe is a standard of care, most emergency medicine residents performed core exams on patients with MCCs. Abnormal core physical exam findings are unusual and rarely lead to further testing or change in management.

Under evidence based medicine review, a number of widely practised physical exam manoeuvres, such as Homan's sign for deep venous thrombosis and capillary refill time for adult hypovolaemia, have been shown to be imprecise, diagnostically useless, and not helpful in medical decision making.<sup>1–3</sup> If one adheres to the tenets underlying evidence based medicine, these signs should no longer be used to make clinical decisions and perhaps should no longer be taught, other than in an historical sense.

Beyond specific manoeuvres, what about the general core physical exam itself—the heart, lung and abdominal exam? Is it useful diagnostically in *all* patient encounters? Does performance of a basic core exam commonly detect significant unexpected abnormalities, does it alter patient management, or does it provide some other less tangible benefit to patients? These are the questions underlying this prospective, observational study. The explicit objectives were to determine: (1) the prevalence of emergency medicine resident physician (emergency medicine residents) performance of the core exam on emergency department patients with minor peripheral (away from the torso and abdomen) chief complaints (MCCs); (2) the yield (frequency per cent of abnormal findings) and clinical impact (frequency per cent of management changes) of performing the core exam on these patients; and (3) the reasons emergency medicine residents perform these general exams.

## METHODS

### Study design and setting

This study, which was conducted at an urban, county hospital emergency department with an annual census of 60 000

patients and an affiliated 4 year emergency medicine residency training programme, consisted of two phases: phase 1 was a prospective observational study of the evaluation of patients presenting to the emergency department with MCCs; phase 2 was a survey of emergency medicine resident physicians (emergency medicine residents). The hospital's Institutional Review Board approved both phases of the study.

### Selection of participants

At the study emergency department all patients seen at triage (non-critically ill and non-ambulance transport patients) are given a triage diagnosis or chief complaint that is entered into a computer tracking system before clinician evaluation. Before the start of the study two investigators (MP and RMR) independently reviewed a comprehensive list of triage diagnoses and chief complaints in the study site's computerised patient tracking system to derive a set of inclusion chief complaints unlikely to necessitate a core exam in evaluation of the chief complaints themselves; only those chief complaints that both investigators agreed met this criterion were selected.

All patients presenting to the emergency department during 1 week blocks (1 week per month from June–September 2003) were screened for the preselected inclusion chief complaints. Patients were excluded if their provider was not an emergency medicine resident or if they reported a second complaint not on the list of eligible diagnoses. Several months were selected to maximise the number of emergency medicine residents rotating through the emergency department during the study period. All emergency medicine resident subjects in phase 2 worked at least three emergency department shifts during phase 1 but were unaware of the performance of phase 1 of the study.

## Methods of measurement, data collection, and outcome measures

Chart review was conducted according to the guidelines set forth by Gilbert *et al.*<sup>4</sup> Data abstraction rules were established a priori and a standardised chart extraction tool was developed. Chart abstractors were full time research assistants of the emergency department, who had performed multiple chart reviews before this study and were blinded to the objectives of the study. They reviewed charts for documentation of: (1) performance of core exams; (2) abnormal core exam findings; and (3) additional work up, testing, medications or follow up related to abnormal core exam findings. The core exam was defined as the cardiac, lung and abdominal exams, and these were evaluated as independent entities (a lung exam could be performed without an abdominal exam and vice versa). A cardiac, lung or abdominal exam was considered to be performed if any portion of that exam was performed—for example, if the patient noted that the abdomen was distended but did not comment on abdominal tone or tenderness, the exam was deemed performed. The charting system used for all patients in the emergency department is a template chart with boxes that are checked if a portion of physical exam is performed; abnormalities of physical exam are noted by checking another set of boxes or writing in the abnormal findings in free text.

Phase 2, the survey of all emergency medicine residents from the study site's emergency medicine residency programme, was conducted in June and July of 2004 to capture both the graduating and incoming resident classes. Respondents only identified their postgraduate year. Emergency medicine residents who were investigators in the study were excluded. Using a 10 point cued numerical scale (0 = never, 5 = about half the time, 10 = always), emergency medicine residents were asked to indicate how often they perform a core exam, defined explicitly as performance of a heart, lung and abdominal exam on emergency department patients with MCCs, defined using examples. Participants indicating scores of  $\geq 5$  were then presented with a list, which was generated by a review of the literature<sup>5-7</sup> and from the authors' experiences, of six (plus "other") potential motivating factors why they might perform the core exam in these patients. Using a 10 point cued numerical scale, in which 0 = no influence and 10 = maximal influence, they were asked to state the level of influence each of these six reasons had on their performance of the core physical exam. They were then asked to delineate

where they learned this practice, with choices including medical school curriculum, emergency medicine attending physicians, non-emergency medicine attending physicians, residency programme curriculum, fellow residents, medical conferences, and journal articles. Finally, emergency medicine residents were asked to identify the single source from this list that most influenced them to perform core physical exams.

## RESULTS

During the time period of phase 1 of the study, 297 patients met inclusion and exclusion criteria. Table 1 shows the patient demographics and chief complaints summary.

Cardiac exams were performed on 71% (210) of patients with abnormalities noted in 5 (2.3%), including tachycardia (2), peripheral oedema (2), and a murmur (1). One ECG was performed due to tachycardia and the patient was discharged without further intervention. Abdominal exams were performed on 46% (137) of patients with abnormalities noted in 2 (1.4%)—a superficial abdominal skin abrasion and ascites in a patient with known ascites; neither of these findings prompted other investigation, treatment or follow up. Lung exams were performed on 82% (244) of patients with an abnormality noted in 0.4% (1)—slight wheezing; no treatment, discharge instruction or follow-up for this wheezing was provided and a chest x ray was not performed. Among the 591 total cardiac, lung and abdominal exams performed, eight (1.4%, 95% confidence interval (CI) 0.7% to 2.7%) were abnormal and only one (0.1%, 95% CI 0% to 0.1%) finding led to further testing (ECG); none led to change in treatment or follow up.

During phase 2 of the study, 46 (20 postgraduate year (PGY) 4, 10 PGY 3, 9 PGY 2, and 9 PGY 1) of the programme's 48 emergency medicine residents were surveyed; the two residents not interviewed were ineligible due to affiliation with the study. Fifty-four per cent of respondents were female and their median age was 28 years (range 25–38 years). In response to the question as to how often they perform a core exam on emergency department patients with MCCs, the mean (SD) score was 5.6 (2.6) on the 10 point cued numerical scale, and 33/46 (72%) emergency medicine residents stated they perform a core exam at least half the time when treating patients with these MCCs.

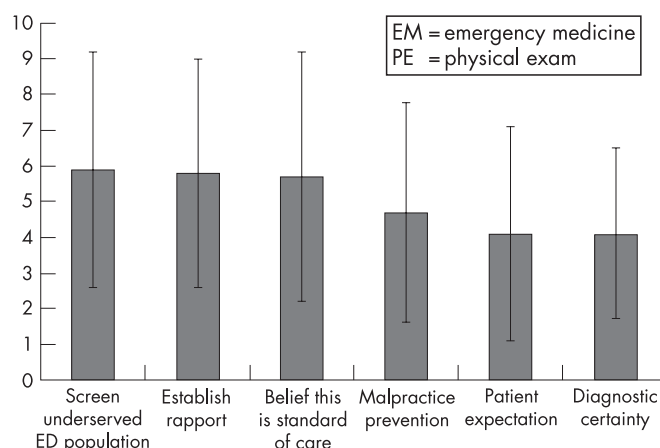
The 33 respondents with scores of  $\geq 5$  completed the remainder of the survey. The primary reasons residents cited for performing a core exam on these patients were the need for screening care in the underserved emergency department patient population, the establishment of physician–patient

**Table 1** Patient demographics and chief complaints summary (n = 297)

|                                       |             |
|---------------------------------------|-------------|
| Male (%)                              | 187 (63%)   |
| Mean (SD) age (years)                 | 36.4 (14.5) |
| Race/ethnicity (%)                    |             |
| African American                      | 148 (50)    |
| White                                 | 78 (26)     |
| Hispanic                              | 38 (13)     |
| Asian American                        | 18 (6)      |
| Undeclared                            | 15 (5)      |
| Chief complaints and triage diagnoses |             |
| Blunt LE Injury                       | 52 (18)     |
| Blunt UE Injury                       | 33 (11)     |
| Red eye                               | 21 (7)      |
| Rash                                  | 18 (6)      |
| Extremity LAC                         | 17 (6)      |
| Suture removal/wound check            | 14 (5)      |
| Dental pain                           | 12 (4)      |
| Other                                 | 130 (44)    |

LAC, laceration; LE, lower extremity (at or distal to knee); UE, upper extremity (at or distal to elbow).

Red eye was primarily conjunctivitis and corneal abrasion. Rash was primarily tinea, contact dermatitis and scabies.



**Figure 1** Reasons emergency medicine residents perform core physical exam (n=33). Cued numerical scale: 0 = no influence, 10 = maximum influence. ED, emergency department.

rapport, and the belief that such exams are the standard of care within the emergency medicine community (fig 1). Residents identified medical school instructors (27; 82%) and emergency department attending physicians (12; 36%) as the principal teachers of this practice.

## DISCUSSION

Although emergency department patients with systemic illness, severe diffuse symptoms or complaints related to the torso or abdomen may warrant a core physical exam as part of their diagnostic work up, the value of this core exam for emergency department patients with MCCs has not been established. In this study we found that emergency medicine residents commonly perform a core exam on emergency department patients with MCCs; abnormal findings, however, were unusual and rarely led to further testing or changes in management.

Historically, the routine performance of complete physical exams for asymptomatic patients began at the turn of the 20th century, triggered by support from the insurance industry and the military.<sup>5</sup> Most published medical literature addresses the role of these exams as part of annual health care maintenance screening rather than during visits for specific complaints.<sup>6-7</sup> Most emergency medicine residents in our study stated they learn this practice in medical school and from emergency medicine attending physicians.

We found little objective support for two of the three primary reasons emergency medicine residents cited for performing a core exam. In terms of screening for disease that changed evaluation or management, the core exam in our population had an extremely low yield. Only one patient had a documented change (performance of an ECG) and whether this truly reflected a change due to the heart exam instead of the abnormal vital sign is questionable. With regard to the second most commonly cited reason—that the core exam is a standard of care in emergency medicine—the American College of Emergency Physicians, the Society of Academic Emergency Medicine, the American Academy of Emergency Medicine and three of the major emergency medicine textbooks do not address this issue.<sup>8-10</sup> The third most common reason emergency medicine residents cited—to establish patient rapport—has not been studied in the emergency department setting. We did not survey patients to see if performance of this core examination really did improve the doctor–patient relationship or patient satisfaction.

## Study limitations

All surveyed emergency medicine residents were from the same training programme and were therefore subject to similarity in clinical practices and attitudes. The primary teaching of this practice was reported to occur in medical school, and therefore a proximity effect may have caused them to perform a core exam more often than physicians who are further removed from training.

Regarding another limitation of general applicability of our findings, the study site's patient population, of which 20% have Medicaid (Medical), 25% have Medicare and 5% have private insurance, likely differs from that seen in more affluent hospitals. With less primary care in our study population, however, one might expect the discovery of an even higher frequency of positive findings requiring treatment from the core exam.

By performing the chart analysis (phase 1) initially, we eliminated any potential Hawthorne effect—a change in behaviour that occurs when individuals know they are being studied—from this first part of the study; the Hawthorne effect may have, however, influenced emergency medicine residents' survey responses in phase 2. We believe that the similar frequency of documented core exams in phase 1 and emergency medicine residents' self reported performance of core exams in phase 2 shows that this effect had little impact.

It is also possible that resident physicians did not actually perform the core exams that they documented. Without clandestine observation of the residents we cannot determine whether they falsely documented exams, but the aforementioned close approximation of findings in phase 1 and 2 argues against this contention.

Finally, our study was not outcome-based. Given the rarity of abnormal physical exam findings and changes in management, however, clinical outcomes such as morbidity and mortality are very unlikely to change significantly with performance of the core exam in these patients. It is possible that core exam findings may have affected management in a manner that was not documented—a physician may have verbally told the wheezing patient to double up on his bronchodilators without documenting this in the discharge instructions. Similarly, normal core exam findings may have influenced care in undetected ways—for example, lack of signs of heart failure may have allowed the physician to prescribe a medication that is contraindicated in heart failure.

## CONCLUSIONS

Because they want to screen an underserved population, establish rapport, and meet what they believe is a standard of care, most emergency medicine residents performed core exams on patients with minor, peripheral complaints in the emergency department. As a screening tool, the practice of routine core exams in this setting is not supported by this study.

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